

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Withdrawn) Polymer patterns formed on a substrate in a given shape, the polymer patterns having at least one pattern which is concave from the surface of the polymer patterns in a direction perpendicular to the substrate and extends in a direction parallel to the substrate, wherein the vertical cross-section of the concave pattern has at least one curved surface.

2. (Withdrawn) The polymer patterns of Claim 1, wherein the vertical cross-section of the concave pattern has a circular or oval shape, the top of which is cut in a straight line.

3. (Withdrawn) The polymer patterns of Claim 1, wherein the concave patterns are close to each other so as to have high density, as the distance between the adjacent polymer patterns is reduced.

4. (Withdrawn) The polymer patterns of Claim 1, wherein the polymer is one of a positive photosensitive polymer and a negative photosensitive polymer.

5. (Withdrawn) The polymer patterns of Claim 1, wherein the vertical cross-section of the concave pattern has a circular or oval shape whose top and bottom are cut in a straight line, and it satisfies the following relation:

$$90^\circ \leq A \leq 180^\circ$$

wherein A represents the angle between the lower surface of the polymer patterns and a straight line which connects a point where the upper surface of the polymer patterns meets the concave pattern to a point where the lower surface of the polymer patterns meets the concave pattern.

6. – 7. (Canceled).

8. (Withdrawn) Metal film patterns formed on a substrate in a given shape, the metal film patterns having at least one pattern which is concave in a direction perpendicular to the substrate and extends in a direction parallel to the substrate, wherein the vertical cross-section of the concave pattern has at least one curved surface.

9. (Withdrawn) The metal film patterns of Claim 8, wherein the inside of the metal film patterns is filled with polymer.

10. (Withdrawn) The metal film patterns of Claim 9, wherein the inside of the metal film patterns is formed of empty space.

11. (Withdrawn) The metal film patterns of Claim 9, wherein the top of the metal film patterns is open.

12. (Currently Amended) A method for forming metal film patterns on a substrate in a given shape, the method comprising the steps of:

- (a) applying a photosensitive polymer on the substrate to form a polymer film;
- (b) placing a photomask on the polymer film;
- (c) irradiating the polymer film with a light moving in any direction through the photomask, so as to form at least one pattern which is concave in a direction perpendicular to the substrate and extends in a direction parallel to the substrate, wherein the vertical cross-section of the concave pattern has at least one curved surface; and
- (d) applying a metal film on the polymer patterns at least one pattern.

13. (Original) The method of Claim 12, wherein the step (b) further comprises the substep (b-1) of placing a diffuser on the photomask, in which the diffuser serves to change the light moving in any direction into a light source perpendicularly incident to the surface of the polymer film and to scatter the perpendicularly incident light source in any directions.

14. (Original) The method of Claim 12, wherein the step (b) of applying the metal film is performed by thin film deposition methods, including sputtering, or thick film-forming methods, including plating.

15. (Previously Presented) The method of Claim 12, which further comprises, after the step (d), the step of removing the polymer by a remover.

16. (Withdrawn) A metal film electrode having a curved metal electrode formed by the method of Claim 12, in which the curved metal electrode is formed in such a manner that the curved metal electrode and an electrode opposite thereto are in an "on" or "off" state (closed or open state) depending on the voltage applied across the two electrodes.

17. (Withdrawn) Cantilever beams formed by the method of Claim 12, which have a round cross-section.

18. (Withdrawn) Metal patterns formed on a substrate in a given shape, the metal patterns having at least one pattern which is concave in a direction perpendicular to the substrate and extends in a direction parallel to the substrate, wherein the vertical cross-section of the concave pattern has at least one curved surface.

19. (Withdrawn) The metal patterns of Claim 18, wherein the vertical cross-section of the concave pattern has a circular or oval shape, the top of which is cut in a straight line.

20. (Currently Amended) A method for forming metal patterns on a substrate in a given shape, the method comprising the steps of:

- (a) applying a photosensitive polymer on the substrate to form a polymer film;
- (b) placing a photomask on the polymer film; [[and]]
- (c) irradiating the polymer film with a light moving in any direction through the photomask, so as to form at least one pattern which is concave in a direction perpendicular to the substrate and extends in a direction parallel to the substrate, wherein the vertical cross-section of the concave pattern has at least one curved surface;
- (d) depositing a metal material on the polymer patterns at least one pattern; and
- (e) removing the polymer by a remover.

21. (Original) The method of Claim 20, wherein the step (b) further comprises the substep (b-1) of placing a diffuser on the photomask, in which the diffuser serves to change the light moving in any direction into a light source perpendicularly incident to the surface of the polymer film and to scatter the perpendicularly incident light in any directions.

22. (Original) The method of Claim 20, wherein the step (b) of applying the metal film is performed by thin film deposition methods, including sputtering, or thick film-forming methods, including plating.

23. (Withdrawn) Metal interconnections formed by the method of Claim 20, which have a round cross-section.

24. (Withdrawn) A plastic mold having a given shape, in which all or part of the vertical cross-section of at least one protrusion formed on the surface of the plastic mold has a round surface.

25. (Withdrawn) The plastic mold of Claim 24, wherein the inside of the plastic mold has empty spaces.

26. (Withdrawn) The plastic mold of Claim 25, wherein the empty spaces are used as microfluidic channels.

27. (Currently Amended) A method for forming a plastic mold having a given shape, the method comprising the steps of:

- (a) applying a photosensitive polymer on the substrate to form a polymer film, wherein the photosensitive polymer comprises a negative photoresist;
- (b) placing a photomask on the polymer film;
- (c) irradiating the polymer film with a light moving in any direction through the photomask, and developing the polymer film after irradiating the polymer film to remove portions of the polymer film not exposed during the irradiating so as to form a plurality of polymer patterns, all or part of the vertical cross-section of which has a round surface;

- (d) applying and solidifying a polymer having different properties from the photosensitive polymer on the polymer patterns to surround each of the plurality of polymer patterns;
- (e) separating the solidified polymer from the substrate; and
- (f) removing the photosensitive polymer from the solidified polymer.

28. (Withdrawn) A microlens array formed using the round protrusions of the plastic mold formed by the method of Claim 27.

29. (Withdrawn) A three-dimensional planar microlens array formed using the round protrusions of the plastic mold formed by the method of Claim 27.

30. (New) The method of claim 12, wherein the photosensitive polymer comprises a negative photoresist which is irradiated in step (c),

the step (c) of forming the at least one pattern further comprises developing the polymer film after irradiating the polymer film to remove portions of the polymer film not exposed during the irradiating such that the at least one pattern comprises a plurality of patterns, and

the step (d) of applying a metal film applies a metal film to surround each of the plurality of patterns.

31. (New) The method of claim 20, wherein the photosensitive polymer comprises a negative photoresist which is irradiated in step (c),

the step (c) of forming the at least one pattern further comprises developing the polymer film after irradiating the polymer film to remove portions of the polymer film not exposed during the irradiating such that the at least one pattern comprises a plurality of patterns, and

the step (d) of applying a metal film applies a metal film to surround each of the plurality of patterns.